
miR-126 regulates angiogenic signaling and vascular integrity.

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Public Summary:

Scientific Abstract:

Precise regulation of the formation, maintenance, and remodeling of the vasculature is required for normal development, tissue response to injury, and tumor progression. How specific microRNAs intersect with and modulate angiogenic signaling cascades is unknown. Here, we identified microRNAs that were enriched in endothelial cells derived from mouse embryonic stem (ES) cells and in developing mouse embryos. We found that miR-126 regulated the response of endothelial cells to VEGF. Additionally, knockdown of miR-126 in zebrafish resulted in loss of vascular integrity and hemorrhage during embryonic development. miR-126 functioned in part by directly repressing negative regulators of the VEGF pathway, including the Sprouty-related protein SPRED1 and phosphoinositol-3 kinase regulatory subunit 2 (PIK3R2/p85-beta). Increased expression of Spred1 or inhibition of VEGF signaling in zebrafish resulted in defects similar to miR-126 knockdown. These findings illustrate that a single miRNA can regulate vascular integrity and angiogenesis, providing a new target for modulating vascular formation and function.

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